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Service, Economics Division

FARMING

ON THE ALMASIPPI SOILS OF CENTRAL MANITOBA, 1950

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CANADA DEPARTMENT OF AGRICULTURE,
MARKETING SERVICE, ECONOMICS DIVISION,
IN CO-OPERATION WITH
THE DEPARTMENT OF POLITICAL ECONOMY,
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FOREWORD

This study is one of a series of similar studies made by the Economics Division of the Canada Department of Agriculture in co-operation with the Department of Political Economy, University of Manitoba, on selected soil types in Manitoba. In 1950 these studies were extended to the light-textured soils of the Black Earth Zone in Manitoba.

Mr. J.G. MacKenzie was in charge of the field party that collected the farm business records and was assisted by Mr. J.C. Gilson, Mr. K.R. Einarson and Mr. R.M. Mayba, all of the Economics Division staff at Winnipeg.

Grateful acknowledgment is made to the municipal officials who provided occupancy information and particularly to those farmers who so generously co-operated with the enumerators in the field.

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FARMING ON THE ALMASSIPPI SOILS OF CENTRAL MANITOBA, 1950

J.P. Hudson 1/

INTRODUCTION

Farm business studies have been made in different districts in Manitoba 2/ representing some of the more important soil types. The studies provide material for a descriptive presentation of the complete physical inventories of the farms, their assets and liabilities, cash receipts, expenses, and some personal data pertaining to the farm operator and his family. The data make it possible to study the progress of the farm operators, and the success with which the farming operations are carried on are related to land use and the type of farm organization.

Method of Study and Source of Information.- An outline of the area to be studied was made on the Carberry Sheet, Land Classification Map of the Manitoba Soil Survey, and land ownership in the outlined area was determined from municipal tax rolls. Complete information on the size of farm units and occupancy was obtained from municipal councillors.

There were 601 occupied farms in the area. A sample of 100 farms was selected for the purposes of this study. The farms were stratified by size and a number of farms were selected at random from each size group. The number of farms selected in each size group was proportionate to the sample as that size group was proportionate to the total population. Enumerators visited the operators of the selected farms and completed a one-call farm business record. When the number of records taken represented 50 per cent of the predetermined proportionate number required in each size group a variance test was run on the difference between cash receipts and cash expenses. The size of the sample in each size group was then revised to give a greater weighting to those size groups which showed the greatest variation. The resulting sample was one in which the variation within each size group was reduced to a minimum. The accuracy of the sample with respect to the variability between size groups was also improved. However, there was a disproportionate number of large size farms enumerated as the greatest variability existed in the large farm size groups. It should be borne in mind that in all cases, in this report, where figures for the total sample are used they tend to have an upward bias because of the disproportionate number of large farms enumerated.

The sample figures can be made representative of the whole population by reference to Table 1 where the total number of farms in the area is shown for each size group.

- 1/ Technical Officer, Economics Division, Marketing Service, Canada Department of Agriculture, Winnipeg, Manitoba.
- 2/ Other Manitoba Studies are: Mackenzie, J.E., Farm Business in the Gilbert Plains and Sifton Area of Manitoba, 1949, January, 1953. T.O. Riecken, A Farm Business Study in the Hamiota Area of Manitoba, 1948, September 1952 and Farming in the Armstrong District of Manitoba, 1948, March 1953, and A Farm Business Study in the Birtle-Shoal Lake Area of Manitoba, November 1953. These studies were made by the Economics Division, Canada Department of Agriculture, Winnipeg, in co-operation with the Department of Political Economy, University of Manitoba.

A total of 103 farm business records were obtained during the summer of 1950. The data collected were for the business year June 1, 1949 to May 31, 1950. Table 1 presents the number and size of the farms and the number of records taken in each size group.

Table 1.- Size of Farm, Number of Farms in Each Size Group and Number of Records Taken for each Group, 601 Farms, Central Manitoba, 1950

Size of farm - acres -	Number of farms	Number of records taken
up to 250	176	23
251 - 410	189	22
411 - 570	110	20
571 - 730	69	19
731 and over	57	19
Total	601	103

GENERAL CHARACTERISTICS OF THE AREA

Location.- The study area lies to the west and south of the town of Gladstone in central Manitoba. It is partly in each of the municipalities of Lansdowne, Westbourne and North Norfolk and is roughly divided in two by an imaginary arc passing through MacGregor, Mayfield Station and a point one mile west of Plumas. The area is about four miles wide on each side of the arc (Figure 1).

Climate.- The long-time average annual precipitation is about 18 inches, half of which occurs during the growing season. The average length of the frost-free period is 125 days. The climate is suited to the growing of hay and pasture crops and all the common cereals.

Geology and Soils.- The lacustrine sediments along the western shore of glacial Lake Aggasiz, east of the Manitoba escarpment, were the parent materials on which developed the sandy loam soils of the area. The soils belong to the Almasippi association of the Black Earth Zone and are light-textured soils described as: "Meadow prairie soils developed on relatively thin lacustrine sand deposits, often strongly impregnated with lime from ground water and overlying heavy clay substratatopography - flat with micro-undulations."^{1/} The soils are subject to drifting and are low in organic matter and phosphorus.

^{1/} Land Classification Map, Carberry Area in Manitoba, Manitoba Soil Survey, University of Manitoba, 1939.

SOUTHERN MANITOBA

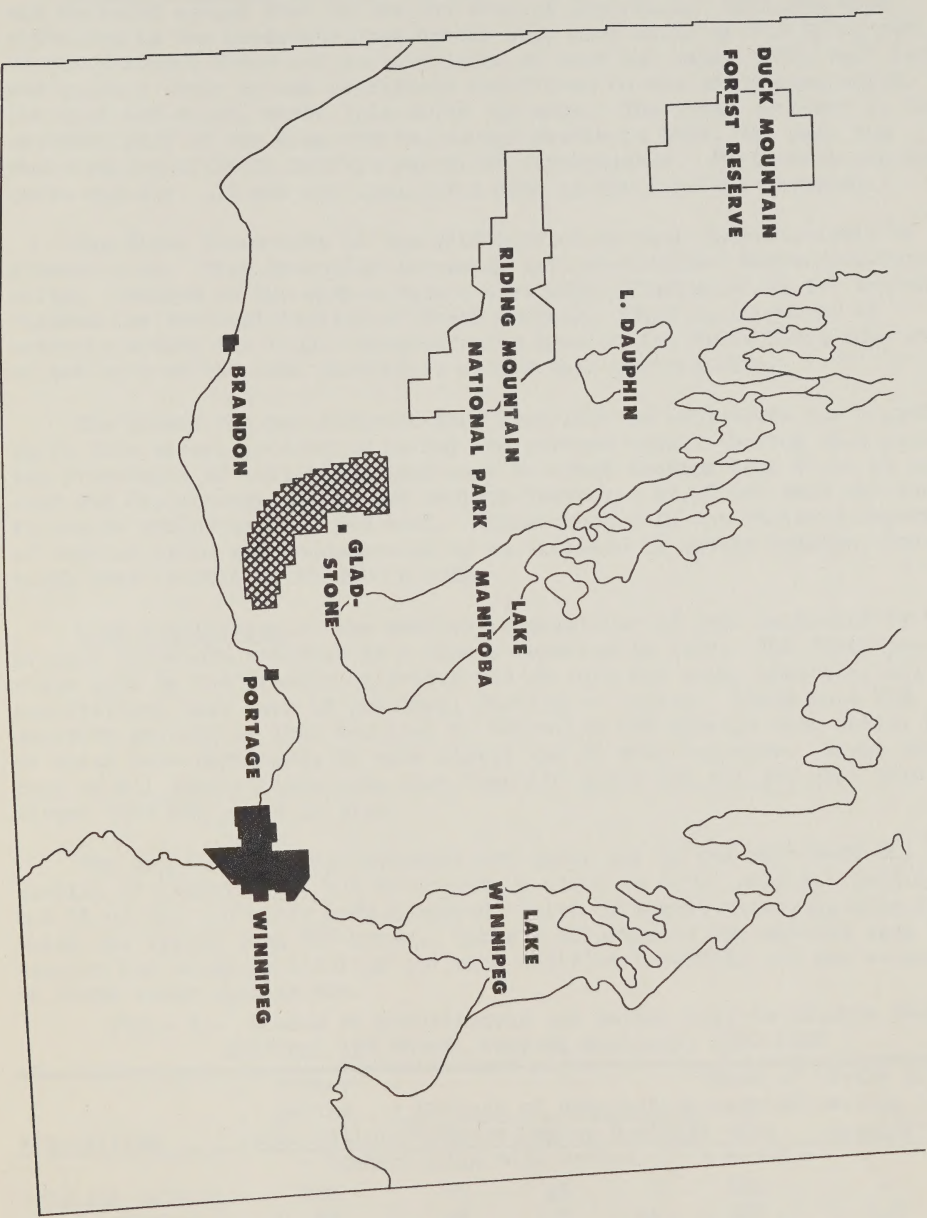



FIGURE 1. SHOWING LOCATION OF THE SURVEY



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Early Settlement and Changes in Agriculture.— Settlement began in 1871 and centered around what is now the town of Gladstone. Settlers were attracted to the Gladstone area by the deep clay soils of the flood plains of the Whitemud River and the abundance of wood and water. The best land was quickly taken up and settlement overflowed to the sandy loam soils, to the west and south, where this study was made. The first settlers in the southern part of the area arrived around Austin in 1882, the year the municipality of North Norfolk was first incorporated. Settlement proceeded quite rapidly. It was not long until most of the land was occupied.

The first farms were of the self-sufficient type characteristic of a pioneer area. They gradually developed into specialized commercial-type units. Changes in the agriculture are broadly illustrated in the census figures for the municipality of North Norfolk. This municipality is entirely within the light-textured soils area of the Black Earth Zone and 40 per cent of the area studied is within this municipality.

The census figures indicate that from 1916 to 1951 there was a gradual shift from cereal production to hay and pasture crops. During this period the proportion of cultivated land sown to wheat dropped from 43 to 16 per cent and the acreage in hay and pasture increased by 1.0 per cent and that in coarse grains by 1.2 per cent. These changes in the relative importance of various crops were accompanied by an increase in cattle numbers, from 8,141 head in 1916 to 11,788 in 1951.

Land Acquisition.— The earliest acquisition of land mentioned by the present operators was that of a legacy received in 1900. The first purchase made by the present operators was in 1910 and since that time all acquisitions have been by purchase, renting or legacy. There were 218 separate parcels of land acquired to establish the present farm units, 157 of which were purchased, 28 were rented and 23 were legacies. Eight per cent of all acquisitions were less than 160 acres and ten per cent were larger than 320 acres in size.

The original holdings averaged 281 acres and 50 per cent were one half section or larger. All but 39 operators added to their original holdings and 61 of the operators made a second, third or fourth addition, none of which was larger than 320 acres. Table 2 illustrates the methods used to acquire the original holdings and each additional holding and the number of farms using each method.

Table 2.— Number of Acquisitions and Method Used to Acquire each Holding, 103 Farms, Central Manitoba, 1900-1950

Acquisition	: Number : : making : Methods of acquisition:				:Size of :Years since :acquisi--:making last :acquisition:Purchase:Legacy:Renting: tion :acquisition	
	- number using each method -				- acres -	
Original holding	103	81	15	7	281	-
First addition	64	44	5	15	225	5.8
Second addition	33	21	2	10	182	4.0
Third addition	14	10	1	3	183	5.0
Fourth addition	4	1	0	3	221	3.0

Land Purchases and Prices.- Seventy-two per cent of all acquisitions were made by purchase. The size of the parcels bought ranged from 40 to 1,028 acres and averaged 245 acres. Ninety of the parcels purchased were one-quarter section or smaller, 53 parcels were from a quarter to one half section in size, eight purchases were three-quarter section units and four were full sections. Only two purchases were made of parcels larger than a section. Seventy-four per cent of all purchases were made during the 12 year period from 1939 to 1950.

The stage of improvement of a farm has a direct bearing on the price paid for the farm. During any one period there may be a considerable range in the price paid for land. From 1910 to 1950 there was a total of 38,475 acres purchased at an average price of \$11.15 per acre. Between 1910-28 prices ranged from \$3.12 to \$31.64 per acre. Eleven purchases were made during this period at an average price of \$19.74 per acre. Land values slumped during the depression years 1929-38 when the average price per acre was \$5.94. Twenty-nine purchases were made during this period, only two of which exceeded \$12.50 per acre. The largest number of purchases were made during the war years 1939-45: 66 parcels totalling 16,575 acres were purchased at an average price of \$7.75 per acre. The general price level was moving up but in 1943 a parcel of 320 acres was purchased for 94 cents per acre. The highest price paid during the period was \$18.75 per acre. Prices continued to rise during the postwar period 1946-50 and nearly one-third of the purchases were made during these years. A top price of \$6,500 for 160 acres was paid in 1948; the lowest price for the period was \$2.81 per acre and the average price was \$16.74. Table 3 shows the price per acre and the number of transactions in different periods from 1910 to 1950.

Table 3.- Price Per Acre and Number of Transactions in Different Periods, 103 Farms in Central Manitoba

Price per acre - dollars -	Years				Total
	1910-28	1929-38	1939-45	1946-50	
	- number of transactions -				
Less than 3.50	1	11	15	1	28
3.51 - 7.50	0	8	25	6	39
7.51 - 12.50	1	8	19	14	42
12.51 - 17.50	1	0	5	12	18
17.51 - 22.50	3	1	2	10	16
22.51 - 32.50	5	1	0	6	12
More than 32.50	0	0	0	2	2
Total	11	29	66	51	157

Land Ownership.- There was a total of 260,841 assessed acres in the area and 96.5 per cent of the total was privately owned. The land under private ownership includes about 4,000 acres owned under the Veteran's Land Act and operated by rehabilitated veterans. Ninety-one per cent of the land was owned by people living in the area or within 20 miles of the area.

The land owned by people who could be considered to be absentee-landlords totalled 14,164 acres and was divided as follows: among those who lived outside the area but in Manitoba, 9,848 acres; those who lived outside of Manitoba but in Canada, 3,198 acres; those who lived outside of Canada, 1,118 acres. Crown land included 1,002 acres under municipal ownership and 1,920 acres owned by the Province of Manitoba. Less than one half of one per cent was owned by mortgage and insurance companies and two per cent was made up of unsettled estates of deceased persons. Table 4 shows the type of ownership and the number of acres in each type for the area studied in 1950.

Table 4.- Type of Land Ownership and Number of Acres in each Type, Area Studied in Central Manitoba, 1950

Type of ownership	: Number of : acres	: Per cent : of total
Private - including V.L.A.	251,617	96.5
Crown - provincial and municipal	2,922	1.1
Mortgage and insurance companies	1,121	.4
Estates under probate	5,181	2.0
Total	260,841	100.0

Services and Facilities.- The area is well served by rail transportation. The average distance to a shipping point is 4.6 miles. The main line of both the C.N.R. and the C.P.R. cross the area in the south and the northern routes of both railroads cross the northern part of the area. The central part of the area is crossed by two branch lines. Provincial Trunk Highway Number One is in the south and Number Four in the north. Municipal gravelled roads are well maintained and the farms are an average of 2.6 miles away from a gravel road. Livestock shipments are made by truck from 79 of the farms and 66 farms ship their cream and eggs by truck. The average distance to a public school is 1.9 miles and 6.2 miles to a high school. Community halls are, on the average, 3.9 miles and churches 3.8 miles from the farms. The average distance to a doctor is 13.6 miles and to a hospital 17.7 miles.

THE OPERATORS AND THEIR FAMILIES

National Origin of the Farm Operators.- The first settlers in the Gladstone district were mostly second generation Canadians of Scottish parentage from the province of Ontario. Many national origins are now represented in the district, Anglo-Saxons predominate and people of Germanic extraction are the second largest group.

Table 5.- National Origin of 103 Farm Operators, Central Manitoba, 1950

Country of origin	Number of operators
Canada	6
British Isles	53
Northern Europe	32
Central Europe	12

Birthplace of the Farm Operators.- Most of the operators on the farms in 1950 were third and fourth-generation Canadians. Nearly 78 per cent of the operators were born in Canada. The 23 operators not born in Canada had all spent the greatest part of their adult life in Canada. Many had arrived as small children when their parents emigrated from their homeland. The most recent arrivals had lived in Canada for 20 years, and all of that time had been spent in Manitoba. All of the foreign born operators, with one exception, had emigrated directly to the prairie provinces; one man had spent a year outside the prairie provinces before taking up residence in Manitoba. Of the Canadian-born operators 84 per cent were born in Manitoba and only three were born outside the prairie provinces. All but 11 of the farm operators were born on farms.

Table 6.- Birthplace of 103 Farm Operators, Central Manitoba, 1950

Birthplace	Number of operators
Canada	80
British Isles	7
Northern Europe	6
Central Europe	8
United States	2

Age of the Farm Operators.- Nearly three-quarters of the farm operators were under 50 years of age. The average age was 44 years, the youngest operator being 24 and the oldest 73. Twenty-two operators were under 35 and 22 also were from 50 to 65 years of age. Six operators were over 65.

Size of the Farm Family.- Most of the farms were single family units, although four farms supported two families each on a father-and-son, or brother-brother partnership basis. The families ranged in size from one to 12 persons and averaged 4.4 persons per farm. Ninety operators were married, 12 were single and one was a widower. Only six of the farms were bachelor establishments for in three cases the operator's sister kept house and in three other cases a mother kept house for her sons. There were 85 families with an average of 3.5 children per family. Two hundred and thirty-four children were still resident on the farms. On 56 of the 74

farms that had sons the eldest son was still at home, whereas on only 40 of the 64 farms that had daughters was the eldest daughter at home. Girls start leaving home at 18 and boys at about 25 years of age.

Table 7.- The Number and Age of Children Resident on 103 Farms in Central Manitoba, 1950

	Age of children					
	Under 5	5 - 9	10 - 14	15 - 19	20 - 24	25 and over
	- number -					
Males	33	39	27	20	14	6
Females	29	34	17	14	4	1

Education of the Operator and His Wife.- Generally the farm wife had more years at school than her husband. On the average, the operators had a grade seven education and the wives had gone to grade eight. Seventeen per cent of the operators had grade ten or better and 33 per cent of the wives had gone to or beyond grade ten. Very few operators had training beyond public school. One had taken a course in carpentry after completing grade 11, one had grade 12 and a diploma course in agriculture; one had been a teacher after completing grade 12. Among the wives, two had been teachers and two had business college training.

Table 8.- Educational Background of Operators and Their Wives, 103 Farms, Central Manitoba, 1950

Education	Operator	Wife
	- number -	
0 - 5	19	12
6 - 8	53	35
9 - 11	26	33
12 and over	5	10
Total	103	90

Occupational History of the Farm Operators.- Farm work was the first full-time job held by 101 of the operators. Eighty-seven started working full-time on their parents' farm, 14 started their full-time work on other farms while one was a labourer and one a clerk before starting to farm. Thirty-one of the operators had at one time or another been employed at other than farm work or absent from farm work while serving in the armed forces. The full-time occupations other than farming were, for the most part, labouring jobs in the bush, in the mines or on the railroads. Other occupations listed included: mechanic, blacksmith, tannery worker, policeman, teacher, salesman, clerk, harness maker and teamster. Table 9 shows the occupation of the operators with the numbers of operators who had been

employed at each occupation and the average numbers of years spent at each occupation for all operators.

Table 9.- Occupations and Average Numbers of Years Spent at Each Occupation, 103 Farm Operators, Central Manitoba, 1950

Occupation	: Number of operators employed in this occupation	: Average years employed for all operators
Age at commencing full time work	103	15
Full time work on parents' farm	87	9
Full time work on other farms	27	2
Full time occupations including war service	31	2
Tenant on other farms	36	3
Tenant on present farm	13	1
Owner of other farms	19	2
Owner of present farm	99	10
Average age of operators	-	44

FARM ORGANIZATION

Physical Aspects

Size of Farm and Tenure.- The farms ranged from 40 to 1,440 acres in size; the average size of farm was 497 acres. Seventy-four farms were owner-operated farms, 25 were part-owner part-tenant farms and the other four were tenant farms. Table 10 shows the type of tenure according to size of farm.

Table 10.- Type of Tenure According to Size of Farm, 103 Farms Central Manitoba, 1950

Tenure	Size of farm (assessed acres)						: All farms
	: 0-250	: 251-410	: 411-570	: 571-730	: 731 over		
	- number of farms -						
Owner	21	17	15	8	13		74
Part owner	2	2	6	9	6		25
Tenant	0	1	1	2	0		4

Land Use.- Unimproved land occupied, on the average, about 29 per cent of the area of all farms, was used largely for pasture and provided some wood for fuel. Fifty-two per cent of the unimproved acreage was suitable for arable culture; the remainder consisted of stony areas in prairie or woodland with some sloughs and gullies.



Good stands of rye and clover.



Table 11.- Cropland Utilization According to Size of Farm,
103 Farms, Central Manitoba, 1949-50

Cropland utilization	Size of farm (assessed acres)					
	0-250	251-410	411-570	571-730	731 over	All farms
Number of farms	23	20	22	19	19	103
- acres -						
Wheat	8	22	44	72	86	45
Oats	30	78	94	137	172	99
Barley	7	11	29	40	66	30
Flax	3	4	10	18	14	10
Improved hay and pasture	23	55	56	63	103	58
Legumes	14	4	14	19	21	14
Other crops	2	5	4	5	9	5
Summerfallow	19	48	76	118	195	87
Total	106	227	327	472	666	348

Wheat occupied about 13 per cent of the improved area and was grown on 76 of the farms (Table 11). Ninety per cent of the farms three-quarter sections or larger grew wheat, while only 51 per cent of the farms one half section or smaller had acreage in wheat. Oats were grown on 97 farms and accounted for 28 per cent of the improved acres. Barley occupied about nine per cent of the improved area and was grown on 63 of the farms. Seventy-two per cent of the farms three-quarter sections or larger, and 46 per cent of the farms one half section or smaller, had land sown to barley. A small amount of flax was grown on one-third of the farms. There were 85 farms that had land sown to improved hay and pasture or legumes. These crops accounted for 35 per cent of the cropland in the smallest farm size group but only 18 per cent in the largest farm size group. Thirty-one farms grew a small acreage of other crops which included such crops as corn for fodder, sunflowers, peas, millet, buckwheat and rye. Summerfallow occupied about 25 per cent of the cropland on all farms.

Livestock.- Horses were the only source of power on 11 of the 96 farms that kept horses; 85 farms used both horse and tractor power and seven farms used only tractor power. There was an average of about four horses per farm. Eight horses were purchased and one colt was born but 17 horses were sold and seven died during the year. Exclusive of horses the number of animal units $\frac{1}{2}$ per farm ranged from one to 74.1 and averaged 21.3 per farm.

Cattle were kept on all but three of the farms and averaged 18.4 animal units per farm; the average herd size was made up of 14.3 animal units on

$\frac{1}{2}$ An animal unit equals one mature cow or horse: 1.4 yearlings or two-year old cattle: three calves: three sows: five pigs raised to market weight: seven ewes or rams: 14 lambs raised to market weight: 100 hens.

the smallest farms and 26.8 on the largest farms. Seventy-seven farms had ten or more cattle animal units. There was a net decrease of 61 head of cattle during the year of the study. Purchases and births totalled 1,002 head and sales, losses and those consumed on the farm totalled 1,063 head. Pigs were kept on 80 farms and poultry on 91 farms but on most of the farms pigs and poultry were only minor enterprises. Twenty-four of the farms that kept pigs raised only enough for home use as sales were made from only 56 of the farms. The numbers of pigs on farms increased by 29 head during the year. Poultry flocks were small and averaged about 75 hens per farm. Most replacements were by purchase of baby chickens. One large turkey enterprise had 1,010 birds; 24 other farms with turkeys had an average of 37 birds per farm. The number of sheep on farms decreased by 16 head during the year, but only four of the seven farms with sheep had flocks large enough to have any influence on the farm business. On the four farms the average size of the breeding flock was 29 ewes and rams. Table 12 shows the average number of animal units for each class of livestock according to size of farm.

Table 12.- Number of Animal Units of Each Class of Livestock According to Size of Farm, 103 Farms, Central Manitoba, 1949-50

Class of livestock	Size of farm (assessed acres)					
	0-250	251-410	411-570	571-730	731 over	All farms
Number of farms	23	20	22	19	19	103
- animal units -						
Horses	3.4	3.4	4.5	4.3	5.3	4.2
Cattle	14.3	14.4	15.3	22.5	26.8	18.4
Sheep	0.2	0.1	0.1	0.5	0.4	0.2
Hogs	1.5	1.4	1.9	2.5	1.6	1.8
Poultry	0.5	0.7	0.7	0.8	1.9	0.9
Total	19.9	20.0	22.5	30.6	36.0	25.5

Machinery and Equipment.- The trend seems to be towards a complete mechanization of farm operations. Only 13 of the farms in the sample did not have a tractor and two of these farms hired the field work done. Fifty-seven farms had one tractor each and 30 had two each; there were two farms with three tractors each and one with four. About 49 per cent of the tractors were 2-3 plow or 3 plow size; 31 per cent were smaller and 20 per cent larger. Tractors were bought new in 52 per cent of the cases, the remainder were purchased as second-hand machines. Twelve per cent had been in use longer than 15 years but 70 per cent had been used for ten years or less. Nearly one-third of the tractors had been purchased in 1949 and 1950.

About one in every three farms had a grain separator and one farm in four had a combine. Three farms had both a combine and a separator. There



The new farm homes are modest in size but adequate.
Rural electrification has greatly improved farm living conditions.



was some sharing of harvesting equipment; four farms owned one half share in a separator and two of the combines were owned on share. On 32 farms, where the age of the grain separator was known, this separator had been in use for 18 years on the average. Five new separators were purchased during the ten years prior to the year of the study. The combines were all purchased during the five years preceding the study year with the exception of a home-built combine. Twelve combines were of the self-propelled type, ten were of the pull-type with auxiliary motor and two were of the power-take-off type. Sixty-two per cent were 12 foot or larger.

A car or truck was available on 90 of the farms. There was a total of 81 cars and 38 trucks : 22 farms had both a car and a truck, six farms had two cars and one farm had two trucks. Thirty per cent of the cars had been purchased new and the remainder in the used car market. Fifty-nine cars had been purchased since 1948, but only 27 cars were three years old or less. Eleven cars were purchased in the current year. About one half of the cars had been in use more than ten years. Sixty-three per cent of the trucks had been purchased second-hand; 20 were older than five years but only five had been with their present owners for longer than five years. The trucks were from one half to two and one half ton in size. Eighteen were one ton or less in size and 19 were over one ton. Table 13 shows the total numbers of each type of special equipment according to size of farm.

Table 13.- Number of Tractors, Combines, Separators, Cars and Trucks
According to Size of Farm, 103 Farms,
Central Manitoba, 1950

Special equipment	Size of farm (assessed acres)					
	: 0-250	: 251-410	: 411-570	: 571-730	: 731 over	: All farms
Number of farms	23	20	22	19	19	103
- total numbers -						
Tractors	17	17	27	28	38	127
Combines	1	2	5	7	9	24
Grain separators	3	5	8	7	13	36
Cars	12	12	18	19	20	81
Trucks	4	9	3	9	13	38

Farm Buildings.- Most of the farms had adequate though unpretentious buildings. Twenty-six per cent of the houses were rated as small, having from one to three rooms, 50 per cent were medium size, having from four to nine rooms, and 24 per cent were large houses. One-third of the houses were in a generally poor and run-down condition, badly in need of paint or repairs. Fifty-three per cent were rated in medium condition, and 14 per cent were in good condition. Ninety-seven farms reported a main barn of which 39 per cent were small, 41 per cent were medium size, and 20 per cent were large barns. Fifty-six per cent of the barns were in poor condition, 29 per cent were rated in fair condition, and 15 per cent in good condition.

Farm Labour.— On the average the farms used 19.6 months of man-labour per farm. As would be expected the amount of labour increased as the size of the farm increased. The smallest farm size group used an average of 14.4 months of labour per farm and the largest farms used an average of 28.5 months. There were 54 farms where day labour was hired, most of which was for summer and harvest work. The average daily wage paid was \$6.77. Thirty-three farms hired labour on a monthly basis and paid an average wage of \$74.00 per month. There were five farms that kept hired help on a yearly basis; one of these farms paid an old man \$240 per year for choreing, one paid \$500, one paid \$952 and two paid \$1,000. On 18 farms the operator was the only member of the labour force; on 33 farms the operator hired some labour. Hired labour was also employed on 38 of the 52 farms where unpaid family labour was available. The operator performed about 83 per cent of the labour on the smallest farms but only about 41 per cent on the largest farms. The distribution of labour by different classes of labour is shown in Table 14 for each farm size group.

Table 14.— Percentage Distribution of Labour According to Different Classes of Labour and Size of Farm, 103 Farms, Central Manitoba, 1949-50

	Size of farm (assessed acres)					: All
Class of labour	: 0-250	: 251-410	: 411-570	: 571-730	: 731 over:	farms
	- per cent -					
Unpaid						
Operator	83.0	79.4	61.5	53.9	41.3	60.6
Operator's family	13.6	14.0	27.4	16.9	34.1	22.7
Paid						
Day help	.4	2.4	2.8	1.6	4.1	2.5
Month help	3.0	4.2	2.6	24.8	16.1	11.2
Year help	-	-	5.7	2.8	4.4	3.0

Financial Aspects

Farm Capital.— The operator's investment in the farm business ranged from \$1,131 to \$56,540 and averaged \$17,430 per farm. The proportion of capital invested in real estate averaged about 50 per cent for all farm size groups. But as the farms increased in size the livestock share of the total investment decreased and the share allotted to machinery and equipment increased. The distribution of the operator's capital investment according to size of farm is given in Table 15.

Real estate investment averaged \$17 per acre on all farms. In the smallest farm size group the capital invested in real estate averaged \$23 per acre but only \$18 per acre in the largest farm size group. The investment in machinery and equipment averaged \$9 per acre for all the farms and did not vary among the different size groups. The livestock investment varied from \$15 per acre in the smallest farm size group to \$5 per acre in the largest and averaged \$7 per acre for all farms.

The average investment per productive animal unit was \$158.

Table 15.- Average Farm Capital According to Size of Farm,
103 Farms, Central Manitoba, 1949-50

Items of capital	Size of farm (assessed acres)					All farms
	0-250	251-410	411-570	571-730	731 over	
Number of farms	23	20	22	19	19	103
- dollars -						
Real estate	3,686	5,383	7,578	10,547	17,448	8,651
Machinery and equipment	1,443	2,874	4,075	6,677	8,826	4,610
Livestock	2,397	2,456	2,769	4,419	5,093	3,358
Seed, feed and supplies	227	393	761	1,215	1,610	811
Total	7,753	11,106	15,183	22,858	32,977	17,430

Farm buildings accounted for a large part of the investment in real estate. Listed separately the average value of buildings on all farms, including the landlord's buildings, was \$4,415. In the smallest farm size group, the building investment averaged \$14 per acre but decreased to less than \$8 per acre in the largest farm size group. Conversely, as the farms increased in size, the investment in buildings per animal unit also increased from an average of \$138 in the smallest farm size group to \$242 in the largest.

Considering the distribution of capital among the fully-owned and the partly-owned farms, the owner-operators had nine per cent more of their capital invested in real estate than did the part-owners. The percentage of capital invested in livestock was 19 per cent for both groups. The part-owners had seven per cent more of their capital invested in machinery and equipment, and two per cent more in feed, seed and supplies, than had the owners. There were only four fully rented farms: the investment in machinery and equipment amounted to 70 per cent of the total investment, livestock 20 per cent of the total, and seed, feed and supplies seven per cent.

Farm Receipts.- Cash receipts were obtained from grain sales on 93 per cent of the farms and from sales of livestock or livestock products on all but two of the farms. The relative importance of receipts from different sources varied among size of farm as is illustrated in Table 16. On the average 48 per cent of the receipts came from crop sales and 38 per cent from sales of livestock and livestock products. Crops accounted for 61 per cent of total cash receipts in the largest farm size group and for only 17 per cent in the smallest. On the other hand, sales of livestock and livestock products provided 73 per cent of total receipts on the

smallest farms but only 38 per cent on the largest farms.

Table 16.- Farm Cash Receipts According to Source and Size of Farm,
103 Farms, Central Manitoba, 1949-50

Items of receipts	Size of farm (assessed acres)						All over:farms
	0-250	251-410	411-570	571-730	731		
Number of farms	23	20	22	19	19		103
- dollars -							
Wheat	93	396	723	1,346	1,994		868
Oats	166	624	868	1,156	2,752		1,064
Barley	38	135	451	785	1,570		566
Flax and other crops <u>a/</u>	90	193	312	351	474		277
Cattle	730	780	981	1,962	1,394		1,143
Pigs and other livestock	307	350	364	585	658		444
Other farm produce	640	421	544	606	735		588
Equipment sales	63	233	423	614	804		411
Other <u>b/</u>	155	188	384	778	697		425
Total	2,282	3,320	5,050	8,183	11,078		5,786

a/ Receipts from other crops include the sale of a small amount of sun-flowers, peas, millet, buckwheat and rye.

b/ Other includes receipts for custom work, outside labour, and sale of previous year's crop during the current year.

All farms over 400 acres in size had receipts from crops. An average of \$1,260 worth of wheat was sold off 71 farms, 79 farms sold \$1,388 worth of oats per farm, and 41 farms sold \$1,421 worth of barley per farm. Flax was sold from 33 farms and returned an average of \$443 per farm. Receipts from "other crops" averaged \$533 per farm for each of 26 farms.

Livestock provided an item of receipts on 99 farms, and averaged 45 per cent of receipts in the smallest farm size group and 18 per cent in the largest. Cattle were the most important source of livestock receipts and were sold from 95 farms for an average value of \$1,239 per farm. Pigs made up 11 per cent of receipts on the smallest farms but only two per cent on the largest farms. Fifty-six farms sold an average of \$509 worth of pigs. Other livestock, such as poultry, sheep and horses provided average receipts of \$273 on 63 farms.

Sales of other farm produce were confined, for the most part, to the sales of eggs and cream. These items were sold off 95 farms and provided average receipts of \$638 per farm. Equipment sales that averaged \$942 per farm were made from 45 farms. Fifty-nine farmers did custom work, or farm work off their own farm for an average receipt of \$288. A cash receipt of \$702 per farm was obtained by 35 farms for the sale of the previous year's crop during the current year.



Grass mixtures and sweet clover are important
soil building crops and effective means of handling
the erosion problem associated with light textured soils
and flat topography



Farm Expenses.— The average amount spent for most items of expense increased with an increase in the size of farm although the proportion that each item was of the total expense did not vary a great deal among different farm sizes. Table 17 presents a distribution of the various items of cash expenses according to size of farm.

Table 17.— Farm Cash Expenses According to Size of Farm,
103 Farms, Central Manitoba, 1949-50

	Size of farm (assessed acres)					All
Items of expense :	0-250	251-410	411-570	571-730	731 over	farms
Number of farms	23	20	22	19	19	103
- dollars -						
Special equipment	206	472	675	1,110	1,521	767
Feed	196	76	56	83	129	110
Fertilizer and seed	32	88	148	268	269	154
Weed sprays	5	20	22	37	58	27
Custom work	55	128	204	205	151	147
Board and wages of paid labour	50	117	215	609	742	329
Overhead <u>a/</u>	118	206	264	428	733	337
Other <u>b/</u>	108	120	193	278	305	196
Total	770	1,227	1,777	3,018	3,908	2,067

a/ Includes taxes, repairs to real estate and general equipment.

b/ Includes blacksmith, small hardware, seed treatment, seed cleaning, binder twine, hail and fire insurance, telephone and other small items.

Special equipment costs were the largest single item of cash expense. These costs include the operating and repair charges for tractor, combines, swathers, threshers and that portion of the operating expense of trucks and cars chargeable to the farm. On the average 37 per cent of all cash expenses were incurred on special equipment. There was very little variation from the average in all except the smallest farm size group where the proportion of total expense allotted to special equipment costs were only 27 per cent of the total cash expense. The average per crop acre cost of special equipment on all farms was \$2.20 and the total cash expenses averaged \$5.95 per crop acre.

Livestock feed expense was another item that was influenced by the size of the farm. In the smallest farm size group livestock feed accounted for one-quarter of the cash expenses but was only a small proportion of expense in all other size groups. The proportion of the expenses allotted to custom work also varied among the different size of farm groups. On the average seven per cent of the farm cash expenses was for custom work; in the half section and three-quarter section size group the average was ten and 12 per cent respectively but only four

per cent in the largest farm size group. Board and wages of paid labour averaged 16 per cent of total cash expenses on all farms and increased from an average of 6.5 per cent in the smallest to 19 per cent in the largest size group.

Farms do not all incur expenses for the same items; very often the item that one farmer must pay for, another farmer provides himself. The type of farm also influences the things a farmer must buy and expenses will differ between one type of organization and another. Table 18 shows the number of farmers having each item of expense and the average amount paid by those who had the expense, the average for all farms, and the proportion that each item is of the total cash expenses for all farms.

Table 18.- Items of Expense and Number of Farms Having Each Item, 103 Farms, Central Manitoba, 1949-50

Item of expense	:	:	:	:
	: Number of	: Average per	: of cash	: Per cent
	: farms re-	: farm for farms:	: expense	: for 103
	: porting the:	: reporting the	: Average for:	: for 103
	: expense	: expense	: 103 farms	: farms
	- number -	- dollars -	- per cent -	
Fertilizer	49	161	76	3.7
Blacksmith and hardware	99	45	44	2.1
Taxes	100	160	155	7.5
Feed	99	114	110	5.3
Other livestock expense	67	15	10	.5
Weed sprays	34	82	27	1.3
Real estate repairs	74	134	96	4.6
Seed	98	82	78	3.8
Special equipment	100	790	767	37.1
Equipment repairs	95	93	86	4.2
Custom work	79	191	147	7.1
Board and wages of paid labour	71	477	329	15.9
Other	102	145	142	6.9

Living Expenses.-- Although the farm provides many perquisites for family living there is still a large expenditure on most farms for non farm-produced goods. The amount spent for living averaged \$1,471 on all farms, \$990 per farm in the smallest size farm group and \$2,078 per farm in the largest size group. The largest single item of cash living expense was the amount paid for food. This item increased with the size of the farm but represented a larger proportion of total living expense in the smallest than in the largest size farm group. For those items of expense that were not common to all farms the trend was for the number of farms that had the items to increase as the farms increased in size. This was true except for education expenses. Although 33 per cent of all farms had an expense for education only 21 per cent of the largest size farm

group had the expense and about 48 per cent of the smallest size farm group spent money on education. Table 19 shows the items of cash living expense and the number of farms having each item with the average amount spent for those farms having the item and the average for all farms.

Table 19.- Items of Family Cash Living Expense and Number of Farms Having Each Item, 103 Farms, Central Manitoba, 1949-50

Items of expense	Number of farms reporting the expense	Average per farm for reporting expense	Average for 103 farms	Per cent of cash expense for 103 farms
	- number -	- dollars -		- per cent -
Groceries, meats	103	450	450	30.5
Fuel, light	102	73	73	5.0
Maids hired	12	140	16	1.1
Auto personal	91	127	112	7.6
Life insurance	48	71	33	2.2
Personal	103	234	234	15.9
Church and charity	92	36	32	2.2
Education	34	70	23	1.6
Health	84	104	85	5.8
Clothing	102	216	213	14.5
New furnishings	75	249	182	12.4
Income tax	7	263	18	1.2
Total	-	-	1,471	100.0

Financial Progress of the Farm Operators

Indebtedness.- Seventy-one operators had an average of \$2,605 owing on agreements of sale or mortgages when they started operating their present farms and 32 operators were free from all debt. In 1950 41 operators owed an average of \$3,625 on land, 62 operators had no land debt and 34 operators were free of any debt. On the average 66 per cent of present liabilities were land debts, 13 per cent were debts on machinery and equipment, 17 per cent were personal cash loans or loans from banks and about four per cent were debts for merchandise purchased, wages outstanding, livestock, feed and seed, taxes or doctor and dentist bills.

The ratio of total assets to total liabilities is indicative of the state of solvency of a business and provides a measure of the ability of the farm to withstand financial reverses. As the farms increased in size the amount of total debt increased but, on the average, the largest farm size group had a more favourable balance of assets to liabilities at 18:1 than did the smallest farm size group where the ratio was only 15:1. The smallest farms had a larger proportion of their total debts owing on equipment and machinery than did the largest farms and the reverse was true with respect to land debts between the large and small farms. Table 20

shows the average distribution of "at start" and "at present" indebtedness among the different farm size groups.

Table 20.- Liabilities at Time of Starting to Farm and at Present,
According to Size of Farm, 103 Farm Operators,
Central Manitoba, 1949-50

	Size of farm (assessed acres)					All
Liabilities	0-250	251-410	411-570	571-730	731 over	farms
Number of farms	23	20	22	19	19	103
- dollars -						
<u>At start</u>						
Total	961	1,124	1,704	2,192	3,336	1,816
<u>At present</u>						
Land	311	636	1,268	782	1,863	952
Equipment	225	281	190	208	37	191
Bank loans	41	205	122	284	103	146
Personal loans	21	76	14	208	237	104
Others	22	93	13	41	90	50
Total	620	1,291	1,607	1,523	2,330	1,443

Present Net Worth.- The present net worth of the 103 farm operators ranged from \$1,705 to \$60,967 and averaged \$19,889 per farm. On 55 per cent of the farms the net worth was between \$10,000 and \$30,000. The size of farm influenced the gain in net worth per year with the largest gains being made on the largest farms. The average gain was \$1,395 per farm and the range was from minus \$180 to plus \$9,228 per year. The net worth of the median 1/ farm was \$16,775: this was a three-quarter section farm with a gain in net worth of \$1,279 per year. Only four of the smallest farms had gains larger than the median whereas the gains per year on all but two of the largest farms exceeded the median. Seventy-two of the farms had gains of \$2,000 or less and on 13 farms the gains exceeded \$3,000; of this latter group only two farms were less than 600 acres in size.

A further influence on the gain in net worth per year is the number of years the farmer has operated his farm. As indicated in Table 21 the newest operators have registered larger gains than those who were on their present farms when farming was a less profitable enterprise and this holds true for all the farm size groups. Some of the more recent gains may be attributed to the change in monetary value of the farm assets and are not necessarily the result of an increase in farm assets due to farm production.

1/ The median is the mid-item of a series arranged in order of size. This means there were as many farms worth more than \$16,775 as there were farms worth less than \$16,775.

Table 21.- Average Gain in Net Worth per Year, According to Years on Farm and to Size of Farm, 103 Farms, Central Manitoba, 1949-50

		Size of farm (assessed acres)					All
Years on farm	:	0-250	251-410	411-570	571-730	:731 over:	farms
- dollars -							
1 - 5		1,124	1,600	1,907	4,049	6,745	2,571
6 - 10		674	1,072	1,769	3,146	4,010	1,875
11 - 15		610	915	1,573	1,504	2,816	1,554
16 - 25		99	572	563	1,192	1,735	989
26 plus		264	-	189	857	941	609
All farms		547	982	1,126	1,619	2,607	1,395

Return to Labour and Management.- A common measure of the efficiency with which a farm operator manages his business is the return which he receives for his labour and management. The labour earnings of a farmer are analogous to the pay of a city worker "before deductions". Labour earnings represent that portion of all farm receipts which remain for the operator after deductions of all farm expenses and charges for factors other than his labour and management. Included in the farm receipts are all inventory increases, a rent value for the use of the house, and a value for perquisites provided by the farm and consumed in the home. Chargeable against the farm business is interest on farm capital, decreases in inventory, depreciation and the value of board and wages of unpaid family labour. In the financial summary (Table 22) the above items are used to calculate total farm receipts, total farm expense and labour earnings.

The operator's labour earnings ranged from minus \$589 to plus \$8,620 and averaged \$2,166 per farm. There was one farm in the one-quarter section size, one in the half-section size and three in the three-quarter section size that yielded a negative return to the operator for his labour and management. Seventeen farms had earnings of less than \$800, 46 farms had earnings of \$2,000 or over, and there were six farms where earnings exceeded \$5,000. Of the 23 smallest farms all but five had labour earnings exceeding \$800; four had earnings of \$2,000 or over. On the 38 farms one-section or larger the lowest earnings were \$510, six had earnings less than \$1,500 and 20 had earnings over \$3,000.

Table 22.- Financial Summary According to Size of Farm,
103 Farms, Central Manitoba, 1949-50

	Size of farm (assessed acres)					All
	0-250	251-410	411-570	571-730	731 over:	farms
	- dollars -					
<u>Receipts</u>						
Cash receipts	2,282	3,320	5,050	8,183	11,078	5,786
Increase in inventory	1,108	1,350	2,020	1,886	3,390	1,914
Farm produce used	396	337	492	496	459	435
Use of house <u>a/</u>	157	171	253	382	429	272
Total	3,943	5,178	7,815	10,947	15,356	8,407
<u>Expenses</u>						
Cash expenses	770	1,227	1,777	3,018	3,907	2,067
Decrease in inventory	224	347	405	608	1,012	503
Board and wages of unpaid family labour	163	175	432	332	794	371
Capital expenditures	1,170	1,536	2,538	3,064	4,133	2,429
Interest on capital <u>b/</u>	388	555	759	1,143	1,649	871
Total	2,715	3,840	5,911	8,165	11,495	6,241
Operator's labour earnings	1,228	1,338	1,904	2,782	3,851	2,166

a/ A rent value for the use of the house is calculated at 12 per cent of the value of the house.

b/ Capital earnings are charged against the farm at five per cent of the total average capital.

FACTORS AFFECTING FARM SUCCESS

In the preceding section we have dealt with the physical and financial organization of the farms in the area. The data has been presented for the size of farm groups that were the original strata for the random selection of the sample farms. This section will deal with those efficiency factors which affect farm returns and over which the farm manager has some control.

For any one year when similar conditions of environment and product prices exist among farms, the farm operator who manages his business so as to obtain the most efficient use of his land, labour and capital will have a higher income than a neighbour who is less efficient in the



Beef and milk produced on improved pastures
stabilize farm income and improve soil fertility.



management of the factors of production. The managerial ability of a farm operator can be exercised in: (1) the size of the farm business which he conducts, (2) crop yields, (3) livestock production, (4) use of labour, (5) use of capital. Several measures can be used as indicative of efficiency in each of these five factors. The measure chosen should be appropriate to the type of farming within the area if a proper relationship among farms is to be shown. A discussion of each of these factors and the measure used for each follows. In all cases labour earnings has been used as the criterion of efficient management.

Size of Business.- No other single factor has a greater influence on farm income than the size of the business which the operator conducts. To have a large farm income a farmer must have a large farm business.

In a mixed farming area a measure of size of farm business must establish a proper relationship among farms where the kinds of crops and the number and kind of livestock vary from farm to farm. Such a measure is a productive man work unit which is described as the amount of work on crops and livestock accomplished in a ten hour day by an average man working at average efficiency. When each kind of crop and each kind of livestock is converted into productive man work units for each farm, the sum of the work units represents the size of the farm business.

The farms ranged in size from 83 to 800 productive man work units. The average size of the farm business was 346 productive man work units per farm. The effect of the size of the farm business on labour earnings is shown in Table 23. It will be noted that as the farms increased in size, in terms of labour requirements, the crop acres and animal units also increased. Within each size group, however, there was a considerable range in the number of crop acres and the number of animal units; usually the farms that had the fewest crop acres had the most animal units. Thus by combining crops and livestock in the farm organization a farmer can have a size of business and earnings comparable to those received on a farm with a much larger acreage. Diversification, in this way, increases the size of the farm business without the necessity of adding more acres to the farm.

Table 23.- Effect of the Size of the Farm Business on Labour Earnings on 103 Farms in Central Manitoba, 1949-50.

Size of business : productive man work : units :	Number of : farms :	Cropland : acres :	Productive : animal units :	Labour : earnings : - dollars -
Up to 159	12	129	7.14	758
160 - 279	29	196	14.47	1,355
280 - 399	29	348	19.80	2,165
400 - 519	17	479	27.68	2,849
520 and over	16	646	40.36	3,967

Crop Yields.— The importance of obtaining good crop yields is emphasized by the returns on those farms that have better than average yields. Good yields go hand in hand with good farm management and result from using recommended cultural practices to increase crop production which in turn increases the operator's labour earnings. The size of a farm business can be effectively enlarged by the substantial gain in yields that can usually be made on existing acreage. The opportunities for increasing crop yields are good. The use of improved varieties of seed, treatment for disease and insects, increased use of commercial fertilizer combined with better tillage and crop rotations will have a marked effect on yields.

The crop yield index is used to measure relative efficiency of crop yields among farms. The crop yield index for each farm shows the per cent that the farm is above or below the average yield for all farms. The index is weighted by the number of acres each farm has sown to each of the major crops grown in the area. The average yields used in calculating the crop yield indexes for the farms were: wheat 15.3, oats 25.8, barley 22.6, flax 5.6. The records were sorted by crop acres into three size groups and subsorted into low, average and high yield farms in each group. The effect of yields on labour earnings is shown in Table 24. A close association can be observed between size of farm and high yields as 15 of the 28 farms in the high yield group were large farms. Generally within each size group the farms with the highest yields had the highest earnings.

Table 24.— The Effect of Crop Yields on Labour Earnings According to Size of Farm, 103 Farms in Central Manitoba, 1949-50

Size of farm and yield	: Number : of farms	: Average : crop acres	: Productive : animal units	: Labour : earnings - dollars -
<u>Less than 200 crop acres</u>				
Yield index - 84 or less	18	114	17.1	1,092
85 - 114	8	117	15.2	1,402
115 and over	5	114	17.9	2,090
<u>200 - 399 crop acres</u>				
Yield index - 84 or less	18	297	15.7	1,294
85 - 114	9	336	15.2	2,184
115 and over	8	299	28.7	2,014
<u>400 crop acres and over</u>				
Yield index - 84 or less	12	541	26.5	2,448
85 - 114	10	591	30.7	3,632
115 and over	15	605	27.0	3,800

Efficiency in Livestock Production.— In an area where the majority of the farms have some kind of a livestock enterprise the efficiency in

livestock production can have an important influence on the relative earnings of the farm operators. The livestock program on most farms can be improved by rigid selection, good feeding and management without increasing overhead costs but, at the same time increasing earnings through increased production.

Production over cost is probably the best measure of livestock efficiency where the kinds of livestock vary among farms. A general farm business record does not separate livestock costs from other costs so it is difficult to measure efficiency in livestock production from such a record. As an alternative measure of efficiency the returns per \$100 invested in productive livestock has been used. The measure, to be valid, assumes a certain uniformity in the type of livestock enterprise among farms as it would be very wrong to compare the return from the investment in a poultry or hog enterprise with that from a range cattle enterprise without considering the feed costs of each enterprise.

Table 25 shows the effect that efficiency in livestock production has on labour earnings when the farms are sorted according to production efficiency and size of livestock enterprise. It will be noted that within each size group the farms with the fewest crop acres had the highest earnings. This is particularly noticeable in the size group with more than 25 animal units of livestock. One explanation lies in the fact that on the smallest farms the livestock enterprises are usually complementary to grain production and are managed more intensively than on the largest farms where they are supplementary enterprises. This explanation is substantiated when it is considered that within each size group the farms with the highest returns per \$100 invested in livestock had double the receipts from sales of pigs and farm produce than did the farms with the lowest returns. Similarly the receipts from sale of livestock other than cattle or pigs was more on the most efficient than on the least efficient farms. These receipts were 2.5 times more in the size group with less than 15 animal units, nearly six times greater in the next group and 3.5 times greater in the size group with more than 25 animal units.

Table 25.- The Effect of Efficiency in Livestock Production on Labour Earnings According to Size of Farm in Productive Animal Units, 103 Farms in Central Manitoba, 1949-50

Size of farm and returns from livestock	Number of farms	Average :		
		productive animal units	crop acres	Labour earnings - dollars -
<u>Less than 15 animal units</u>				
Livestock returns - \$65 and less	7	5.7	356	1,333
66 - 99	13	8.9	283	1,530
100 and over	13	7.2	240	1,547
<u>16 - 25 animal units</u>				
Livestock returns - \$65 and less	15	20.0	351	1,619
66 - 99	14	20.0	334	1,772
100 and over	10	19.3	306	2,551
<u>More than 25 animal units</u>				
Livestock returns - \$65 and less	11	36.6	523	2,544
66 - 99	10	39.0	481	3,429
100 and over	10	35.3	295	3,688

Labour Efficiency.— Labour is one of the most costly items charged against a farm business. The farmer who keeps himself and his labour force fully occupied at productive work and devises labour saving methods to increase labour efficiency will increase the scale of his farm operations and so maximize his output and increase his earnings. The most important part of the labour force on Manitoba farms is the farm family. As families cannot be hired and fired at will, a farm operator should carefully plan his work program so as to keep the family profitably and fully employed the year round.

A measure of labour efficiency on farms with varying amounts of crops and livestock is the number of productive man-work units handled per man. Table 26 shows the effect that labour efficiency, measured by productive man-work units per man equivalent, has on labour earnings.

Table 26.— Effect of Labour Efficiency on Labour Earnings,
103 Farms in Central Manitoba, 1949-50

Productive man work units per man	: Number : of farms	: Men : equivalent	: Total : P.M.W.U.'s	: Labour : earnings -- dollars --
50 - 149	19	1.53	189	1,130
150 - 199	24	1.77	310	1,606
200 - 249	34	1.71	382	2,620
250 - 300	16	1.49	408	2,325
300 and over	10	1.45	512	3,678

The most efficient users of labour were the largest farms where the scale of operations allows a man to combine his labour with larger amounts of capital in land, equipment and livestock. The investment in machinery per man equivalent on the farms where labour efficiency was the greatest was 3.6 times more than on the farms with the lowest labour efficiency. Similarly the investment in livestock was 3.1 times greater between the most efficient and least efficient group of farms.

Capital Efficiency.— Large investments are required to outfit a modern farm. The buildings, equipment and livestock found on farms today, as well as the land itself, are all items of great value. A farm operator must be careful to allocate his capital resources among those agents of production which will give him the greatest margin of profit. The cattleman or dairyman will need to have a good proportion of his investment in productive cows. The grain farmer will have a large investment in land and machinery. The mixed grain-livestock or livestock-grain farmers have the problem of apportioning capital among their enterprises and combining it with available labour to get the best profit-making combination. It is not always possible to arrive at an optimum combination of labour and capital. Quite often a farm operator is forced to substitute an uneconomic capital unit for unavailable labour. He will increase his own output but his earnings may be adversely affected by interest and depreciation charges on the capital item. On the other hand

a farm operator who has a large amount of available labour, and little opportunity for expanding his farm business, might lower his labour efficiency by working his surplus of labour with less capital equipment. Establishing a favourable labour-capital ratio requires a careful appraisal of each individual farm business.

A measure of capital efficiency is the number of years that it takes for total receipts to equal total capital. This measure is known as the rate of capital turnover. Because of the large investment required in farming, relative to volume of receipts, the rate of capital turnover is generally slower than in other businesses. The average rate of capital turnover for the sample farms was 2.5 years. Table 27 shows the association between the rate of capital turnover and labour earnings. Included in the table is the labour-capital ratio for the various sorts. It is significant to note that a large investment, in itself, is not a guarantee of large earnings. The group of farms with the lowest capital investment per man had the highest earnings.

Table 27.- The Effect of Rate of Capital Turnover on Labour Earnings, 103 Farms in Central Manitoba, 1949-50

Rate of capital : turnover - years -	Number of : farms	Size of farm : in P.M.W.U.'s	Capital per : man equivalent : - dollars -	Labour : earnings
0.5 - 1.5	11	320	8,392	3,061
1.6 - 2.0	13	369	9,790	3,022
2.1 - 2.5	28	391	10,524	2,520
2.6 - 3.0	25	325	11,798	2,223
3.1 - 4.0	13	385	10,403	1,369
4.1 - 7.6	13	302	12,640	831

Farm Management Efficiency

In the preceding analysis it has been apparent that the assumption in single factor analysis, that all other factors remain equal, is not always true. The results obtained are influenced by the interrelationship of factors. This close relationship between factors makes it impossible to separate the influence of any one factor from the associated influence of other factors. For example, efficiency in the size of the farm business was closely related to efficiency in one or several other factors. The 47 farms that were above average in size of farm business were also above average in at least one other factor. Most farmers can improve their management efficiency as very few farmers attain a high degree of efficiency in all five factors of management. Efficiency in a single factor is not enough to assure a farmer above average earnings and the alert farm manager will strive for efficiency in all factors.

The progressive effect of above average rating in the five factors of management on labour earnings is shown in Table 28. Eight of the farmers were below average and only three above average in all five

factors. The difference in the average labour earnings of these two groups was \$4,843. The table also shows as a percentage the amount that each additional factor of efficiency adds to the total difference in labour earnings between the least efficient and most efficient groups.

Table 28.- The Effect of Above Average Rating of Five Factors ^{a/} on Labour Earnings, 103 Farms in Central Manitoba, 1949-50

Number of factors : above average :	Number : of farms :	Labour : earnings : - dollars -	Per cent of increase between least efficient and most efficient
0	8	704	-
1	16	978	6
2	26	1,371	8
3	31	2,426	22
4	19	3,901	30
5	3	5,547	34

a/ The factors used were: (1) size of business measured by productive man work units (average all farms:346). (2) Efficiency in crop production-Crop yield index (see discussion re table 24). (3) Efficiency in livestock production measured by return per \$100 invested in productive livestock (average all farms \$80). (4) Labour efficiency measured by productive man work units per man (average all farms:212). (5) Efficient use of capital-measured by the number of years for total receipts to equal total capital (average all farms 2.5 years).

There are usually a large number of extreme cases represented in a group average and no farm exactly coincides with the average. The farm operator who may be looking for a guide in planning or adjusting his farm business must recognize that the average attainment of a group of farms is usually a mediocre goal at which to strive and will result in mediocre returns. However, the cumulative experience of a group of farms does provide useful guidance for those who are seeking means of improving their farm business. When considering group averages from farms similar in organization to his own the farm operator should aim at a goal considerably above the average. Farming is a long-run business and one's sights should be kept high if one expects long-run results to be above the average.

An over-all plan for all farms cannot be derived from average group data. No two farms are exactly alike and the problems of management differ from farm to farm. Each farm is an individual unit having a unique setup with regard to its physical and financial conditions and the ability and inclinations of the operator. The type of farm organization best suited to the managerial capacity of an individual farm operator is a matter of adaptive selection for each individual.

Above Average Efficiency.- Table 29 was compiled from the average data for the three highest earnings farms in each of three representative



Farm lanes lead to well graded and gravelled
municipal roads which make markets readily accessible



size groups. It is designed to show the type of organization and the significance of the factors of management which are associated with higher than average earnings. The data for each individual farm in each of the three groups was strikingly similar. No single farm differed markedly from the average in any significant feature of organization or production.

Table 29.- Farm Organization and Management Factors for the Average of Three High Earnings Farms in Three Representative Sizes, 103 Farms in Central Manitoba, 1949-50

Farm organization and efficiency factors		:Size of farm (assessed acres					
		:	320	:	480	:	640
<u>Capital distribution</u>							
Real estate	%	46	51	43			
Livestock	%	30	24	25			
Machinery and equipment	%	21	20	25			
Seed, feed and supplies	%	3	5	7			
<u>Use of cultivated land</u>							
Wheat and flax	%	5	3	20			
Coarse grains	%	44	56	39			
Hay and pasture	%	29	11	24			
Summerfallow	%	22	30	17			
<u>Receipts from current production</u>							
Grain sales	%	39	48	60			
Livestock and livestock product sales	%	61	52	40			
<u>Livestock</u>							
Productive animal units	no.	27.7	28.5	39.6			
Returns per \$100 invested	\$	109	103	92			
Returns per animal unit	\$	136	138	129			
<u>Crop yield index</u>							
		102	131	115			
<u>Rate of capital turnover</u>							
	years	2.4	1.6	2.2			
<u>Labour and equipment</u>							
Man equivalents	no.	1.24	1.94	2.28			
P.M.W.U.'s per man	no.	275	198	249			
Machinery capital per man	\$	2,500	1,804	2,909			
Machinery investment per crop acre	\$	12	14	12			
Special equipment cost per crop acre	\$	2.87	2.97	2.90			
<u>Operator's labour earnings</u>							
	\$	3,020	4,070	4,420			

The figures should provide a better guide to the individual interested in improving his farm business than do the larger group averages previously used. They are presented here as indicative of what good management, and

above average efficiency, can achieve in terms of operator's labour earnings. Any plans for readjustment that these data might guide the individual to make will be conditioned by his own inclinations and how a change may be adapted to his own labour and capital resources.

The farms in the three representative size groups shown in Table 29 successfully follow a system of mixed cropping associated with a fairly large livestock complement. This program results in a minimum of the farm area in summerfallow and a relatively high percentage of acres in improved hay for feed and pasture. Such a program fulfils the double function of retaining a high level of fibre and organic matter in the soil, and maintains a protective cover which reduces the chance of loss through wind erosion.

While straight grain farming is practiced on some farms the danger of soil drifting requires special tillage practices and careful soil management to insure against serious loss through drifting. A mixed grain-livestock combination appears to be more naturally adapted to the physical limitations of the soil in the area. At the price-cost relationship that existed in 1949-50 this mixed type of farm organization was the one found on the farms which had the highest labour earnings for the size groups shown in Table 29.

SUMMARY

This is a study of a group of representative farms on the light-textured soils of the Black Earth Zone in Manitoba. The area lies to the west and south of the town of Gladstone in Central Manitoba.

The study deals with the average data from the sample of 103 farm business records randomly selected from a total population of 601 occupied farms which were stratified into five farm size groups.

Farm capital averaged \$17,430 per farm and was distributed among real estate, machinery, livestock, seed, feed and supplies in the proportion of 50, 26, 19, five per cent respectively. The average investment in real estate was \$17 per acre.

On the average the farms follow a mixed grain-livestock type of organization. About 71 per cent of the farm area is improved and wheat, oats and barley occupy 13, 28 and nine per cent respectively of the improved land; hay and legumes for pasture, seed and feed, 20 per cent and summerfallow 25 per cent. Cattle is the major livestock enterprise, there being an average of 18.4 animal units of cattle per farm.

The average cash receipts per farm were \$5,786. Forty-eight per cent of current cash receipts were obtained from crop sales and 38 per cent from the sale of livestock and livestock products.

Farm cash operating expenses averaged \$2,067. Thirty-seven per cent of the expenses were incurred as special equipment cost. Living expenses averaged \$1,471 per farm.

On the average the present net worth of the farm operators was \$19,889. Average yearly gains in net worth amounted to \$1,395 per farm with the largest gains being made on the largest farms and on those farms which commenced operations during the recent period of rising prices.

About three-fifths of the farms had no land debt while one-third were free of all debt. The largest farms had a more favourable ratio of assets to liabilities than did the smallest farms.

On all but four farms the operator had positive labour earnings. The average labour earnings for all farms was \$2,166.

